

#### 4.5 PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: McCormack-Williamson Tract Restoration Planning, Design and Monitoring Program I  
 Applicant Name: Dr. Jeffrey Mount, Director, Center for Integrated Watershed Science  
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Amount of funding requested: \$ 556,200 for 2 years

Indicate the Topic for which you are applying (check only one box).

- |   |   |
|---|---|
| <input type="checkbox"/> Fish Passage/Fish Screens      | <input type="checkbox"/> Introduced Species       |
| <input checked="" type="checkbox"/> Habitat Restoration | <input type="checkbox"/> Fish Management/Hatchery |
| <input type="checkbox"/> Local Watershed Stewardship    | <input type="checkbox"/> Environmental Education  |
| <input type="checkbox"/> Water Quality                  |   |

Does the proposal address a specified Focused Action? ☒ yes ☐ no

What county or counties is the project located in? Sacramento

Indicate the geographic area of your proposal (check only one box):

- |  |   |
|--|---|
| <input type="checkbox"/> Sacramento River Mainstem                               | <input type="checkbox"/> East Side Trib: _____                  |
| <input type="checkbox"/> Sacramento Trib: _____                                  | <input type="checkbox"/> Suisun Marsh and Bay                   |
| <input type="checkbox"/> San Joaquin River Mainstem                              | <input type="checkbox"/> North Bay/South Bay: _____             |
| <input type="checkbox"/> San Joaquin Trib: _____                                 | <input type="checkbox"/> Landscape (entire Bay-Delta watershed) |
| <input checked="" type="checkbox"/> Delta: <del>McCormack-Williamson Tract</del> | <input type="checkbox"/> Other: _____                           |

Indicate the primary species which the proposal addresses (check all that apply):

- |  |  |
|--|--|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon |  |
| <input type="checkbox"/> Winter-run chinook salmon   | <input type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Late-fall run chinook salmon  | <input type="checkbox"/> Fall-run chinook salmon   |
| <input type="checkbox"/> Delta smelt   | <input type="checkbox"/> Longfin smelt             |
| <input type="checkbox"/> Splittail   | <input type="checkbox"/> Steelhead trout           |
| <input type="checkbox"/> Green sturgeon  | <input type="checkbox"/> Striped bass              |
| <input type="checkbox"/> Migratory birds   | <input type="checkbox"/> All chinook species       |
| <input type="checkbox"/> Other: _____  | <input type="checkbox"/> All anadromous salmonids  |

Specify the ERP strategic objective and target (s) that the project addresses. Include page numbers from January 1999 version of ERP Volume I and II:

M-W Tract Restoration is a Stage 1 Programmatic Action (p. 99, ERPP) Targets served include: Fresh Emergent Wetland Habitat (tidal and non-tidal), Seasonal Wetland Habitat, Delta Sloughs, Riparian and Riverine Aquatic Habitats, Freshwater Fish Habitat and Essential Fish Habitat, Sediment Budgets (Stage 1 Targeted Research), Restoration of natural floodplain and flood processes, Invasive aquatic organisms and plants.

Indicate the type of applicant (check only one box):

- |  |   |
|--|---|
| <input type="checkbox"/> State agency                    | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit     |
| <input type="checkbox"/> Local government/district       | <input type="checkbox"/> Private party  |
| <input checked="" type="checkbox"/> University           | <input type="checkbox"/> Other: _____   |

Indicate the type of project (check only one box):

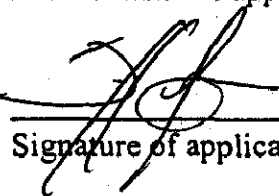
- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Planning | <input type="checkbox"/> Implementation |
| <input type="checkbox"/> Monitoring          | <input type="checkbox"/> Education      |
| <input type="checkbox"/> Research            |   |

By signing below, the applicant declares the following:

- 1.) The truthfulness of all representations in their proposal;
- 2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- 3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

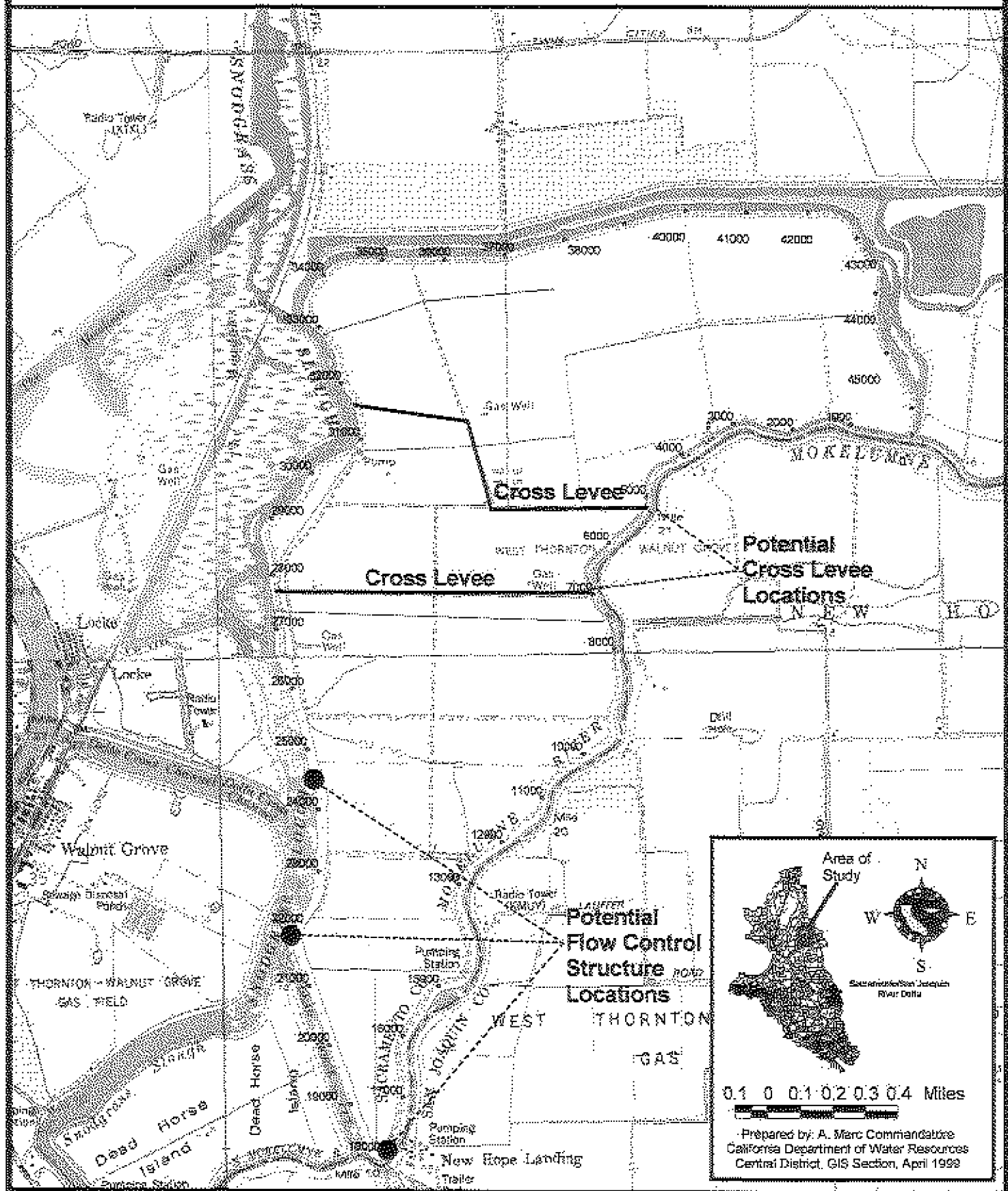
Dr. Jeffrey Mount

Printed name of applicant

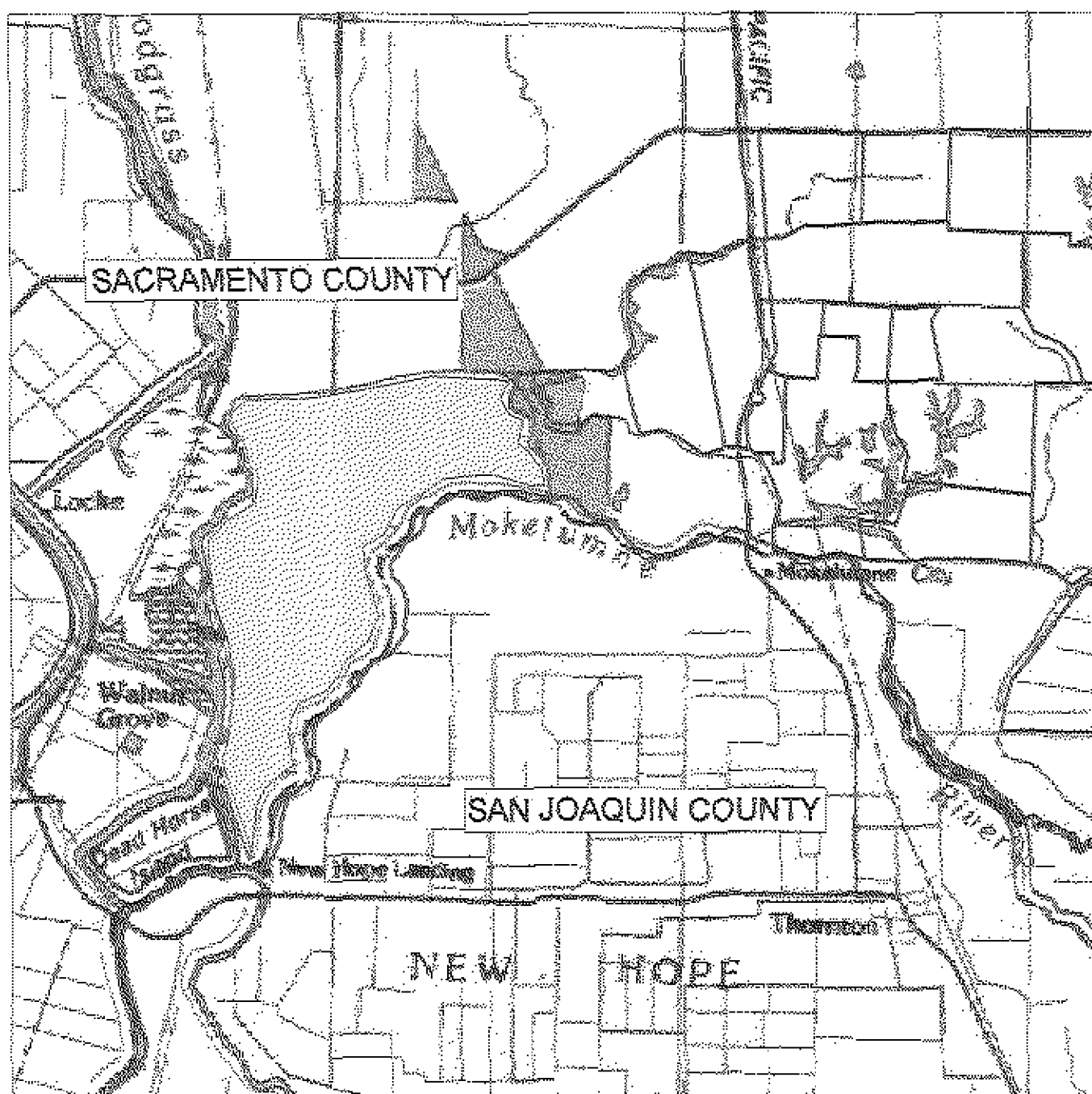


Signature of applicant

# McCormack - Williamson Tract Restoration Planning, Design, and Monitoring Program



# McCormack Williamson Tract



1 0 1 2 3 Kilometers

-  Cosumnes River Preserve
-  McCormack Williamson Tract
-  Counties

Information Center for the Environment, UCD  
 Data Provided by: Teale Data Center, CA DFG, and CDF  
 (Study Site boundary is available from ICE)

**McCormack-Williamson Tract Restoration Planning,  
Design and Monitoring Program: I**

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Dr. James Quinn, Information Center for the Environment  
Dr. Gregory Pasternack, Land, Air, and Water Resources  
Dr. Geoffrey Schladow, Civil and Environmental Engineering  
Dr. Theodore Grosholz, Environmental Sciences and Policy

***Participants and Collaborators:***

California Department of Water Resources  
The Nature Conservancy

***Type of organization and tax status:***

Institution of higher education / tax exempt  
Tax identification number: 94-6036494-W

## Executive Summary

The University of California, Davis Center for Integrated Watershed Science and Management, in collaboration with the California Department of Water Resources, and The Nature Conservancy propose to develop a multi-objective restoration planning, design and monitoring program for the McCormack-Williamson Tract. This proposal is a request for support for the historic research and baseline studies necessary for restoration planning and development of a monitoring program (Tasks 1-4, 6). Support for the design portion (Task 5) of this project is requested in an identical, companion proposal submitted by DWR (McCormack-Williamson Tract Restoration Planning, Design and Monitoring Program: II).

The McCormack-Williamson Tract is a 1600 acre Delta island located in southwestern Sacramento County within the Sacramento-San Joaquin Ecological Management Zone. The Tract lies immediately downstream of the confluence of the Cosumnes and Mokelumne Rivers and is currently farmed. The Tract has been designated in the ERPP as a Stage 1 Targeted Action for restoration and flood management. CALFED funding has been received by The Nature Conservancy for acquisition of the tract. This proposal seeks funds for baseline studies necessary for project planning and design, and the development of long-term monitoring programs. The primary ecological/biological objective of this work is to restore self-sustaining freshwater tidal marsh and riparian habitat within the McCormack-Williamson tract. Restoration of these priority habitats is intended to: 1) support aquatic and riparian species of concern, 2) promote Delta foodwebs by reintroducing more natural, unimpaired flow conditions, 3) provide support for adaptive management of seasonally and perennially flooded habitats in order to promote native invertebrates and fish and to limit the impact of invasive species, such as the Chinese Mitten Crab, and 4) provide new web-based expert systems to support biological monitoring in restored tidal marsh systems. Ancillary benefits of this project include: 1) enhance flood management in the project area, 2) new methodologies for assessing historic and current hydrologic conditions and sedimentologic flux rates in the Delta, 3) new expert systems for biological monitoring in the Bay-Delta region. All aspects of this project support CALFED objectives within the Bay-Delta.

The hallmark of this project is its parallel programs that link the activities of UC Davis researchers with DWR and TNC scientists and planners in order to inform design of the restoration project, maximize its ecologic/biologic objectives, and develop new methodologies that meet CALFED's ERP objectives. In order to expedite implementation, these programs will be conducted at the same time over a two-three year period. Six tasks have been identified with a significant range of deliverables.

Task 1: Restoration Planning: analysis of historic hydrogeomorphic conditions. This task recognizes that historic conditions are the best guide for restoration design and the foremost determinant of the likelihood of restoration success. An intensive coring program within the Tract and in nearby reference wetlands will be conducted over a two year period. Cost: \$84,397.

Task 2: Modern hydrologic and sedimentologic regime. New methods and instrument packages will be employed to calculate suspended load and bedload flux rates from the Cosumnes and Mokelumne Rivers over a two year period. This information will be combined with historic analyses to aid in modeling and designing sustainable freshwater tidal marsh systems. Cost \$182,364.

Task 3: Baseline studies of aquatic resources. This work will focus on documenting pre-project conditions of aquatic foodwebs and species of concern in the vicinity of the Tract. The

emphasis of this task will be upon evaluating the use of flooded areas by native and non-native invertebrates and fishes over a period of two years. The goal will be to guide design of the project to maximize support for native species and limit, where possible, invasive species. These baseline studies will support a long-term biological monitoring program. Cost \$154,231.

Task 4: Baseline studies of riparian resources. The UC Davis Information Center for the Environment (ICE) will establish a vegetation inventory and classification system of riparian habitat resources in the M-W Tract and adjacent riparian areas. Additionally, the Point Reyes Bird Observatory will conduct extensive bird surveys in the area. This two year program will guide restoration design to optimize riparian resources and will serve as baseline data for long-term monitoring. Cost \$77,639.

Task 5: Design of engineering alternatives. The hydrogeomorphic and biological analyses conducted in Tasks 1-4 will be utilized in guiding the design of the M-W tract restoration program. CIWSM scientists will work collaboratively with the Department of Water Resources and The Nature Conservancy to support design of a set of engineering alternatives for the restoration program. All efforts will be coordinated with on-going flood management studies in the area being conducted by the US Army Corps of Engineers. This program will be completed for public review and comment during the third year of the project. Cost \$335,000.

Task 6: Data management and monitoring systems. During the first two years of this project ICE will develop software to manage and analyze biologic data developed for this project. This data analysis system will be used to support long-term monitoring of the project, as well as other CALFED projects in the region. Additionally, a website will be developed to disseminate data and analyses directly to stakeholders and decisionmakers in the region. Cost \$57,569.

The parallel submission of two proposals (I and II) is to separate administrative responsibilities for tasks. The total support requested from CALFED for the UC Davis portion of this project (Tasks 1-4, 6) is \$556,200, including overhead. It is requested that Task 5 be funded separately in a contract with DWR. It is anticipated that the UC Davis portion of this project will be funded through the Interagency Agreement between UC Davis and CALFED. Matching funds for this project totaling \$250,000 are provided by the UC Davis Center for Integrated Watershed Science and Management through a Packard Foundation Conservation Program grant. The UC Davis John Muir Institute for the Environment will provide \$50,000 support for a Science Coordinator for the project. In-kind services include space, computer system support, and faculty salaries. DWR will provide \$50,000 of in-kind services in the form of project management. No adverse third party impacts have been identified.

The goal of this project is to utilize pre-project baseline studies to develop and implement a long-term monitoring program. Replicate, georeferenced sampling programs will be established for geomorphic and biologic monitoring and submitted for CALFED and peer review prior to the end of the project. All UC Davis researchers are faculty members with well-established research records in their respective fields. DWR has extensive experience in design and implementation of restoration projects.

All activities associated with this proposal will be coordinated with on-going 905b studies being conducted by the US Army Corps of Engineers. Funds requested here are for studies that directly support CALFED ERPP goals and are not part of the 905b project. With support from acquisition funding from CALFED, TNC will provide stakeholder outreach and coordination for this project. The UC Davis CIWSM will provide technical expertise to TNC for this outreach program under the current UC Davis/TNC MOU.

## **Project Description**

The University of California, Davis Center for Integrated Watershed Science and Management (CIWSM), in collaboration with the Department of Water Resources (DWR), The Nature Conservancy (TNC), and the Cosumnes River Preserve Partners, propose to develop a linked, multi-objective restoration design and monitoring program for the McCormack-Williamson Tract. The tract is located within the Sacramento-San Joaquin Delta Ecological Management Zone within Sacramento County, and lies immediately downstream of the confluence of the Cosumnes and Mokelumne Rivers (Fig. 1). This proposal directly addresses six tasks needed for project planning, design of the restoration project, and development of a long-term monitoring program for evaluation of restoration effectiveness and support of adaptive management. **Funds are requested through this proposal for the UC Davis portion of this project.**

### **Task 1. Restoration Planning: analysis of historic hydrogeomorphic conditions (G. Pasternack, J. Mount, in collaboration with DWR).**

In order to develop a project design that will restore and maintain tidal freshwater wetland habitats, it is necessary to document the physical processes of historic wetland evolution within the M-W Tract. These processes form the most reliable indicator of the potential response of habitats to restoration efforts. The hydrologic and geomorphic processes that control spatial heterogeneity in wetlands are manifest through patterns and rates of sediment accumulation, as well as spatial and temporal distributions of vegetation.

The general objective of this task is to determine the geomorphic potential of the site to revert back to a functional tidal freshwater marsh with an array of beneficial aquatic and riparian habitats. The geomorphic potential is defined here as the elevational, stratigraphic, and sedimentary conditions necessary for a tidal freshwater wetland to exist and function. Based on the work one of us has conducted in Chesapeake Bay (G. Pasternack), even if intertidal hydrodynamics are restored and plants begin to grow, the long term ecological success of the restoration will depend on watershed-delta interactions that are manifest in the geomorphic conditions.

This task utilizes an intensive program of lithologic, paleoecologic and radiocarbon analyses of cores from the M-W Tract and a nearby reference wetland in Delta Meadows to provide: a) an assessment of the stability of the physical structure of the system in the past; b) determination of the amount and direction of energy driving changes in sediment patterns in the system; c) quantification of the relative proportion of vertical accretion due to watershed influx of inorganic sediment versus in situ biomass accumulation; and d) characterization of the spatio-temporal distributions of habitats within and closely adjacent to the M-W Tract.

### **Task 2: Modern hydrologic and sedimentologic regime: (G. Schladow, J. Mount, G. Pasternack, in collaboration with DWR):**

In order to guide restoration planning, the historical analysis of the M-W Tract marsh will be coupled with on-going experiments, partially funded with seed monies by the Packard Foundation Conservation Program, to evaluate the hydrologic and sedimentologic regime of the lowermost Mokelumne and Cosumnes Rivers. The estimation of the quantity and nature of sediment supply is at the crux of all wetland restoration projects in the Delta. The confluence of the Cosumnes and Mokelumne Rivers, just upstream of the M-W Tract, provides a unique opportunity to (1) document the impact of dams on sediment flux rates into the Delta, (2) determine the adequacy of the current rate of sediment supply (and quality) to the task of restoring the M-W Tract, and (3) develop a removable instrument package that can readily provide such information at any point in the Delta.

We will distinguish the sediment transport regimes in these two rivers in response to variations in seasonal conditions. Continuous, in-situ measurements of water temperature, flow, suspended sediment concentrations, and passage of bed load material as sediment waves will be collected using Current and Sediment Flux Monitoring Stations (CSFMS) within each river. These measurements will be augmented by suspended and bottom sampling of the sediment and cross-channel velocity and depth profiling.

The sediment flux measurements can be compared with estimated historical sediment supply rates for the M-W Tract and for the naturalized reference systems we propose to core (Task 1). The proposed measurements will support and are compatible with the on-going sediment measurement program of the USGS in the Delta, as the techniques used for suspended sediment are identical. Where the present proposal extends that work is in the ability to obtain a combined (suspended plus bedload) sediment flux, and the ability to discern the sediment size distribution.

**Task 3: Baseline Studies of Aquatic Resources (P. Moyle, E. Grosholz in collaboration with DWR)**

During the first two years of this project, the CIWSM, in cooperation with on-going efforts sponsored by EBMUD, USFWS, DWR and CDFG, will conduct a series of surveys of baseline conditions of aquatic resources within the vicinity of M-W Tract. These surveys will be used to establish baseline biologic conditions prior to the implementation of a final restoration plan for the Tract, and will serve as the basis for a long-term monitoring program (Task 6) that assesses restoration effectiveness and informs future tidal freshwater marsh restoration projects in the North and East Delta. Baseline studies will emphasize documentation of life histories of target species of concern and the role that new habitat creation will have on invasive, non-native aquatic species.

The key issues that drive the sampling program include: how and when do native fishes and invertebrates use flood plains; and how can flooded areas can be managed to favor native species while discouraging the non-native species that compete with or prey on them? We are beginning studies to address these issues and others on the Cosumnes River Preserve, supported by seed monies from the Packard Foundation. It is highly desirable to expand our present limited study to encompass year-round sampling for juvenile fishes in the lowermost Cosumnes and Mokelumne Rivers. These studies are needed to examine the trophic interactions of the fishes using the flooded areas, and to develop a study/monitoring plan for the M-W tract, downstream of our present study areas. Year-round sampling in various habitats in the lower rivers will allow us to determine how native (and non-native) fishes and invertebrates use these habitats, even in the absence of flooding. This, in turn, should allow us to develop hypotheses leading to adaptive management strategies to improve these areas for native fish rearing (e.g., increased habitat complexity, such as submerged trees, in areas with moderate current favors native fishes). Year-round sampling will also allow us to compare growth and diets of fish inside and outside the flood plains. If flooded areas do indeed enhance growth and survival, we need to determine what characteristics of flooded areas are optimal for fish (e.g., open areas vs. forested areas) by examining diets to provide insights into factors making areas favorable.

**Task 4, Baseline Studies: Riparian Resources (Directed by J. Quinn).** During the first two years of this project, CIWSM, in conjunction with The UC Davis Information Center for the Environment (ICE), will establish a vegetation inventory and classification system based on the methods used by TNC and CNPS. The vegetation inventory will produce a baseline dataset of riparian habitat resources in the M-W Tract and adjacent riparian areas. This survey will build upon the existing

wetland mapping efforts of Ducks Unlimited and CDFG. The dataset will be integrated into the current ICE GIS system of biological and abiotic data for the Cosumnes River Watershed funded, in part, by a Packard Foundation grant. ICE will work with the Point Reyes Bird Observatory (PRBO) to design and implement a riparian bird survey over a three year period. The Riparian Habitat Joint Venture has proposed a methodology using 14 target species to identify stress to riparian system health and to assess the effectiveness of restoration efforts. We propose to implement and test their methodology in the M-W tract as a pilot for wider deployment in the CALFED region.

**Task 5: Design of engineering alternatives (Directed by the Department of Water Resources):** The hydrogeomorphic and biological analyses conducted in Tasks 1-4 will be utilized in guiding the design of the M-W tract restoration program. CIWSM scientists will work collaboratively with the Department of Water Resources and The Nature Conservancy to support the design of a set of engineering alternatives for the restoration program. The goal of these design alternatives will be to configure the M-W tract to support CALFED ERPP goals for restoration of functional and sustainable tidal freshwater marsh habitat and to enhance flood management and water conveyance objectives. All designs and cost considerations will be submitted to CALFED and relevant agencies for review and consideration for funding. Additionally, this work will be integrated with on-going work on regional flood management currently being conducted by the Corps.

It is anticipated that DWR will develop a design that allows phased implementation of the project with the first phase as soon as practicable. Reconnaissance studies indicate that reconfiguration of levees within the lower reaches of the tract may allow initial formation of flooded habitat without significantly impacting flood flows.

**Task 6: Data Management and Monitoring Systems (J. Quinn):** As is repeatedly noted in the March 1999 CMARP report, data systems for handling the influx of biological monitoring data from CALFED projects are not yet in place, particularly for data not taken from fixed stations (in contrast with most IEOP monitoring data). We propose to adapt an existing software environment, "Observe" and its derivatives, that was first developed by TNC and ICE to manage volunteer monitoring data in the Cosumnes Preserve. Observe was later modified for use in national parks, California state parks, and UNESCO Biosphere Reserves. It forms a basis for a proposed Biological Observation Database (BOD) that CDFG will develop to manage comparable data (other than listed species occurrences, which will continue to be managed by the CA Natural Diversity Database). BOD is now being prototyped for use with salmonid data from Endangered Species Act permits on the North Coast (in cooperation with NMFS). The software will be adapted for the monitoring described above, and tested more generally for its applicability to the riparian bird, riparian vegetation, and fish occurrence data expected from this study and similar CALFED projects and CMARP activities. An important aspect of the project is to make the data available to the public and other cooperators in the watershed. ICE will make the appropriate spatial data available through an interactive mapping tool over the World Wide Web.

## Ecological/Biological Benefits

### Objectives, Benefits and Linkages

This project directly addresses one of the most significant ecosystem stressors in of the Delta and Central Valley: the loss of existing riparian and tidal freshwater marsh habitat. Loss of this habitat has affected aquatic foodweb productivity within the Delta, habitat for native resident and anadromous fish and estuarine invertebrates, and key riparian vertebrate species. This project supports the implementation of actions that will substantially increase tidal freshwater habitat within a 1600 acre tract. The location of this tract has the added benefit of significantly increasing the linkages between aquatic and terrestrial habitat corridors of the East and North Delta and the channel, floodplain, and upland habitats of the Cosumnes and Mokelumne Ecological Management Zones.

The hallmark of this project is its linked, parallel programs. In order to support adaptive management and the development of a self-sustaining project, design work will be guided by a comprehensive understanding of the historic physical conditions as well as current biologic and physical constraints on restoration success. The surveys conducted for these analyses will also provide (rare) pre-project baseline conditions and form the basis for design and implementation of a long-term monitoring and research program. This monitoring program will be the foundation of adaptive management in this project and will support stepwise implementation.

The M-W tract restoration project is a Stage 1 Programmatic Action (page 99, 1999 ERPP). This programmatic action will support a broad range of restoration targets and programmatic actions outlined in the ERPP. Specifically:

- \*Priority habitats identified in the ERPP that will be restored within this project or are directly affected by this project include Delta Sloughs, Fresh Emergent Wetland Habitat (tidal and non-tidal), Seasonal Wetland Habitat, Riparian and Riverine Aquatic Habitats, Freshwater Fish Habitat and Essential Fish Habitat, and, depending upon ultimate design of the program, Agricultural Lands.
- \*By re-creating tidal freshwater marsh within the M-W tract, the project will support efforts to create a more natural (unimpaired) seasonal Delta outflow pattern. The sedimentologic and hydrologic regime modeling efforts to be conducted for this project will allow quantification of this effect and estimation of its impact on Delta flows.
- \*Sediment budgets for the Delta have been identified as a key Stage 1 targeted research element. The assessments conducted for this project will directly address this issue, including the development of new methods for assessing sediment flux in other tributaries within the Delta.
- \*The restoration of natural floodplain and flood processes within the East Delta is a high priority target of the ERPP. This project directly addresses multi-objective design of the tract in order to promote natural flood processes. In addition, the biological monitoring and analysis to be conducted for this project supports Stage 1 targeted research necessary to evaluate species habitat preferences and utilization within shallow wetland environments.
- \*Invasive aquatic organisms and plants pose a major threat to the success of restoration projects throughout the Delta region. The biological monitoring and analysis conducted for this project will allow documentation of the colonization of restored tidal freshwater marsh and riparian systems and the influence of invasive species.

## Key Hypotheses and Conceptual Models

The M-W tract restoration project is, by nature, multi-objective, allowing a broad range of linked hypotheses and assumptions to be tested and evaluated. The key hypotheses/questions that drive the tasks of this project include:

- \*Historical conditions on the M-W tract serve as the primary guide for design and implementation of self-sustaining tidal marsh and riparian habitat restoration (Task 1).
- \*Alteration of the hydrologic and sedimentologic regime of the Mokelumne River due to dams is a significant limitation on the amount of acreage that can be restored to tidal marsh in the M-W tract (Task 2).
- \*Colonization of newly-formed tidal freshwater marsh by a mix of native and non-native invertebrates will dictate the native fish growth and survival. Modeling of invertebrate species-habitat relations can be used to guide on-going and future restoration design and implementation in order to maximize natives (Task 3).
- \*Re-connection of existing riparian systems and restored riparian habitat to the East and North Delta as well as the riparian systems of the Cosumnes and Mokelumne Rivers will significantly increase abundance of targeted riparian avian species (Task 4).

## Compatibility with Non-Ecosystem Objectives: Levee Stability Program

The M-W tract project is integral to the on-going 905b Project Study Plan for the Lower Cosumnes and Mokelumne Rivers being directed by the Corps, with TNC and EBMUD as non-federal sponsors. A portion of the 905b project will address flood damage reduction and ecosystem restoration through levee alteration at the M-W tract. The M-W Tract lies immediately below the confluence of the Cosumnes and Mokelumne Rivers and Morrison Creek. During high flow events the levees along the northeast end of the M-W tract create a backwater that increases upstream flood elevations. Levees along the northeast portion of the tract are limited in height in order to reduce this backwater effect. During very large runoff events, these levees commonly fail, causing the tract to rapidly fill to capacity. The rapid filling of the tract causes failure of the southern levees which, in turn, release a flood surge into the North and South Forks of the Mokelumne, threatening the stability of numerous Delta island levees.

It is anticipated that the design and implementation of the M-W tract restoration will enhance conveyance within the North Delta and play an integral part in lowering flood stage elevations within the lower Cosumnes and Mokelumne Rivers. The hydrologic analyses and design of this project will be coordinated with the Corps' 905b flood damage reduction project for the Cosumnes and Mokelumne Rivers.

Along with the improvement of flood conveyance in the East and North Delta, this project will have major significance in the evaluation of the impact of Chinese Mitten Crabs on levee stability. The aquatic resource surveys to be conducted for this study will emphasize the role of flooded habitat on non-native invertebrates. One of the Co-PI's (Grosholz) will focus on the impact of seasonal flooding on mitten crab life cycles. This research is expected to inform elements of the restoration design in this and other tracts.

### **Technical Feasibility and Timing**

A primary goal of this project is to support rapid, phased implementation of the M-W tract restoration program. Scientists and representatives for CISWM, TNC and DWR will work closely in the early stages of this project to insure that data collection, while focused on addressing key hypotheses and questions, directly addresses issues that will affect design. It is particularly important that data collection and analysis proceed in parallel with design work in order to meet our goal of full completion of the design program during the third year, creation of environmental documentatoin, and submission of requests for implementation support prior to the end of the project. We do not foresee any technical obstacles to completion of this project.

The following represents an abbreviated time table of anticipated activities. Table 1 summarizes the anticipated deliverables associated with this project.

#### **Year 1 Activities:**

Bi-monthly meeting of partners; Development of general design criteria and preliminary designs; stakeholder meetings  
Initiation and completion of M-W tract coring program  
Deployment of sensors for sediment transport studies  
Completion of 1D hydrologic models  
Establishment of biological survey sites and initiation of sampling program  
Initiate development of project GIS and biologic data analysis programs  
Presentation of initial results to CALFED review teams

#### **Year 2 Activities:**

Bi-monthly meeting of partners; development of design options; stakeholder review  
Analysis of cores and completion of historical analysis  
Completion of analysis of sediment transport and hydrologic regime  
Development of 2D hydrologic models for potential restoration sites  
Continued sampling program and initial analysis of biological data  
Completion of project GIS and continued development of data analysis program  
Presentation of results to CALFED review teams and local meetings

#### **Year 3 Activities:**

Bi-monthly meeting of partners; completion of design options; stakeholder review  
Development of phased approach and adaptive management plan  
Presentation of final monitoring plan for peer review  
Upgrade of GIS and placement of results on web  
Publication of results in peer-reviewed journals  
Submission of funding request for restoration program to CALFED and other agencies  
Initiation of CEQA/NEPA process

**Table 1: Restoration Planning, Design and Monitoring Program  
Anticipated Deliverables**

<b>Task</b>	<b>Anticipated Deliverables</b>	<b>Time</b>
<b>Task 1. Restoration Planning: analysis of historic hydrogeomorphic conditions</b>	Report: Historic sedimentation patterns and habitat distribution of McCormack-Williamson Tract.	24 months
	Report: Limitations on Restoration Design for McCormack-Williamson Tract.	24 months
<b>Task 2. Modern hydrologic and sedimentologic regime</b>	Report: Sediment Flux Rates of the Mokelumne and Cosumnes Rivers into the Delta.	24 months
	Report: Comparison of Modern and Historic Sediment Flux Rates in the lowermost Mokelumne River and its Impact on Restoration.	28 months
	Model: 1D Flow Model for the McCormack-Williamson Tract Restoration Program.	12 months
	Report and Instrument Package: Use of Current and Sediment Flux Monitoring Stations (CSFMS) for Restoration Design Assessment.	20 months
	Report: Recommended monitoring plan for sedimentation within the restored McCormack-Williamson Tract	28 months
<b>Task 3. Baseline studies of aquatic resources</b>	Report: Aquatic Resources of the lower Mokelumne River/ McCormack-Williamson Tract area.	24 months
	Report: Impact of seasonal flooding on primary productivity in the McCormack-Williamson Tract area.	28 months
	Report: Seasonal flooding and the life cycle of the Chinese Mitten Crab.	28 months
	Report: management of seasonal flooding and tidal freshwater marshes for native invertebrates and fish.	24 months
	Report: Recommended monitoring plan for aquatic invertebrates and fish with the restored McCormack-Williamson Tract.	28 months
<b>Task 4. Baseline studies of riparian resources</b>	Report: Baseline inventory of riparian habitats in the lower Mokelumne River and McCormack-Williamson Tract.	20 months
	Report: Avian diversity in the lower Mokelumne and McCormack-Williamson Tract.	24 months
	Report: Recommended methods of assessment of riparian ecosystems with the CALFED region.	24 months
	Report: Recommended monitoring plan for riparian habitat and avian species with the restored McCormack-Williamson Tract.	28 months
<b>Task 5. Design of engineering alternatives</b>	Report: Design alternatives for restoration of the McCormack-Williamson Tract.	12 months
	Report and Engineering Design: Recommended phased restoration plan for the McCormack-Williamson Tract.	24 months
	Engineering Specifications for McCormack-Williamson Tract Restoration.	30 months
<b>Task 6. Data Management and Monitoring Systems</b>	Report and Programs: Expert systems for analysis of biological monitoring data from CALFED projects.	20 months
	Website: McCormack-Williamson Tract Restoration Project.	2 months
	Program: Web-based tools for analysis of monitoring data.	24 months

## Monitoring and Data Collection Methodology

The biological/ecological objectives of the project are outlined in more detail above. To summarize, the objectives of the M-W tract restoration are to expand the spatially-linked tidal freshwater marsh and riparian habitat in the East Delta in order to enhance native resident and anadromous fish habitat, and support targeted riparian vertebrate species. The design of this project will attempt to enhance self-sustaining hydrologic and sedimentologic processes within the tract that support native species, presumably to the detriment of invasive species.

One of the primary objectives of this project is to develop the baseline hydrologic, sedimentologic and biologic surveys that not only support project design, but guide adaptive management during and after project implementation. Recognizing the experimental nature of this project, it is anticipated that project scientists will work closely with ERP and CMARP staff in the development of a monitoring program. Funds to support the long-term monitoring program will be requested when final project implementation funding is requested.

Methods of data collection and analysis can be broken down by tasks. Task 1 will depend upon high-density coring of the M-W Tract in order to construct a stratigraphic record. Standardized core analysis techniques will be utilized, along with radiocarbon dating and pollen analysis. Direct comparison with cores from reference wetlands will be used to develop spatio-temporal maps. Task 2 will utilize new methods for estimating sediment flux within the Mokelumne and Cosumnes system. A Current and Sediment Flux Monitoring Station (CSFMS) will be deployed in each river. The system will comprise an acoustic current meter, water level gauge (pressure), temperature probe, optical backscattering sensor, sonic bed elevation probe, and digital data logger (programmable). These measurements will be supplemented by suspended and bottom sampling of the sediment and cross-channel velocity and depth profiling at the measurement sites using an acoustic doppler current profiler. Calibrations of the optical sensors will be made by laboratory determinations (at U. C. Davis) of total suspended solids and sediment size distribution using sediment collected during the sampling at the sites. Standardized protocols will be utilized in data collection and analysis.

The biological surveys of Tasks 3 and 4 will be conducted at replicate georeferenced sites throughout the area surrounding the M-W tract. Frequency of sampling will depend upon target species and will be increased during high growth season or during significant hydrologic events. Sites for benthic and plankton samples will be chosen to match fish sampling sites to aid in integration of fish and invertebrate species studies. We will be sampling fishes using a variety of techniques including standard seines and traps, specially designed fyke nets, and light traps (for larvae). Part of our initial study is simply to determine which techniques are most effective for sampling target species and life history stages in flooded habitats, which are notoriously difficult to sample. We will be taking advantage of the sampling knowledge gained by T. Sommer (DWR; current a Resources Agency Fellow at UCD) in sampling the Yolo By-pass. Standard avian species sampling methods that are well-documented by PRBO will be employed in riparian areas.

Table 2. Monitoring and Data Collection Information

I) Biological/Ecological Objective			
Question to be Evaluated/ Hypothesis	Monitoring Parameter(s) and Data Collection Approach	Data Evaluation Approach	Comments
Assessment of restoration potential of tidal freshwater marshes	Stratigraphic and chronostratigraphic analysis of Tract cores; assessment of hydrologic and sedimentologic regime of lower Mokelumne/Cosumnes	Comparison of stratigraphic analysis with nearby reference wetland; modeling of potential sedimentation rates and aquatic/riparian plant communities	Studies will be utilized in project design and design of monitoring program
Ecosystem benefits of flooded areas	Year around sampling program focused on usage of flooded areas in lower Cosumnes/Mokelumne by native and nonindigenous fish species and on channel/riparian areas surrounding M-W tract	Comparison of data analysis techniques with range of current methods employed in Delta, specifically those employed by DWR in Yolo By-Pass	Analyses will guide design work; data handling and sampling methods will be incorporated in final monitoring program design
Ecosystem benefits of increased connectivity in riparian habitat	TNC/CNPS Riparian Vegetation Survey methods. PRBO avian species inventories.	Use of 14 target species as indicator of riparian health based on Riparian Habitat Joint Venture methodology.	Analyses will guide design work of DWR and form basis for monitoring program.
Data handling and analysis of biological monitoring programs	Assembly of data into project GIS, analysis using modified "Observe" program	Comparison of data analysis techniques with range of current methods employed in Delta	Data handling methods will be incorporated in final monitoring program design

## **Local Involvement**

The success of this M-W tract requires extensive local stakeholder and agency involvement. In the earlier grants supporting acquisition and acquisition-related costs, TNC received funding for supporting stakeholder outreach activities. This work is on-going and is under the direction of TNC Staff. The CIWSM and DWR will offer scientific expertise to TNC in these efforts and will contribute staff to stakeholder and agency meetings.

Since TNC will be the primary land owner for this project, we do not anticipate significant access problems. Sacramento County has been notified, by letter, of the intent to submit this proposal to CALFED.

## **Cost**

The total cost of the UC Davis portion of this project, including overhead, is \$556,200. As noted in the Project Description, although all components of this proposal are linked, each task is a stand-alone project capable of separate or if necessary, phased funding. At the request of CALFED, the CISWM will provide more complete descriptions and budget breakdowns for each task. Project management at UC Davis will be directed by J. Mount and supported by the CISWM Scientific Coordinator.

The CISWM has recently completed negotiation with CALFED on an Interagency Agreement. It is assumed that funding for elements of this project that will be conducted by UC Davis will be implemented through the Interagency Agreement at the standard 10% overhead rate. For administrative reasons it is requested that Task 5, funding for design work and environmental documentation, be supported in a contract directly to DWR.

The total cost of DWR design and environmental documentation work for this project (Task 5) is \$355,000. DWR will provide project supervision and in-kind services; Curt Schmutte will be responsible for supervising Task 5.

Task	Direct Labor Hours	Direct Salary and Benefits	Service Contracts	Material and Acquisition Costs	Miscellaneous and other Direct Costs	Overhead and Indirect Costs	Total Cost
Task 1: historic analysis	RA/UG 2,200 hours	36,608		Sampling materials; Laboratory supplies and equipment: 22,600	Travel: 2,880	6,209 (10%) Fee Remission: 9,100 Equipment: 7,000	84,397
Task 2 Hydrologic and Sedimentologic Regime	RA/Fac 2,440 hours	40,389	Woods Hole Subcontract: 76,744	Sampling materials; Laboratory supplies; 7500	Travel: 2,880	12,751 (10%) Fee Remission: 9,100 Equipment: 33,000	182,364
Task 3 Aquatic Resources	PGR: 4,400 hours; RA: 2,200 hours	\$116,937		Sampling Materials; Laboratory Supplies; 7,000	Travel: 3,000 Boat Operation: 5,000	13,194 (10%) Fee Remission: 9,100	154,231
Task 4 Riparian Resources	CRS; 832	17,581	PRBO: 50,000		Travel: 3,000	7058 (10%)	77,639
Task 5 Project Design (DWR)							355,000 (DWR)
Task 6 Data Handling and Management	PGR, PA, AA, PM: 1,923	47,790				4779 (10%) Equipment: 5,000	57,569

\*This is the full amount requested from CALFED. The UC Davis Center for Integrated Watershed Science and Management will provide a match of \$250,000 toward the total amount requested along with in-kind services. DWR is providing \$50,000 of in-kind services in the form of project management for Task 5.

Task	Quarterly Budget Oct Dec 99	Quarterly Budget Jan Mar 00	Quarterly Budget Apr Jun 00	Quarterly Budget Jul- Sep 00	Quarterly Budget Oct Dec 00	Quarterly Budget Jan Mar 01	Quarterly Budget Apr Jun 01	Quarterly Budget Jul- Sep 01	Total Budget
Task 1: Historic Analysis	10,550	10,550	10,550	10,550	10,550	10,550	10,550	10,550	84,397
Task 2: Hydrologic and Sedimentologic Regime	22,796	22,796	22,796	22,796	22,796	22,796	22,796	22,796	182,364
Task 3: Aquatic Resources	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279	154,231
Task 4: Riparian Resources	9,705	9,705	9,705	9,705	9,705	9,705	9,705	9,705	77,639
Task 5: Project Design (DWR)	44,375	44,375	44,375	44,375	44,375	44,375	44,375	44,375	355,000
Task 6: Data Handling and Management	7,196	7,196	7,196	7,196	7,196	7,196	7,196	7,196	57,569
Total	113,900	113,900	113,900	113,900	113,900	113,900	113,900	113,900	911,200

## Cost Sharing

The CIWSM, in association with The Nature Conservancy and the Cosumnes River Preserve partners, has received Packard Foundation Conservation Program funds to establish the *Cosumnes Consortium*: a coordinated university/agency/foundation partnership dedicated to evaluation and monitoring of ecosystem conservation and restoration efforts, and supporting the information needs of adaptive management in the Cosumnes River watershed. Matching funds will be supplied from the Consortium grant to support activities directly related to the M-W tract study. Elements of Tasks 2, 3, and 6 have been granted seed monies from the Consortium totaling approximately \$200,000; \$50,000 will be supplied from the Packard grant for this project in order to support project science coordination.

In addition to the monies supplied by the Packard Foundation, the UC Davis John Muir Institute of the Environment is currently supplying matching funds for a Science Coordinator for the CIWSM. In-kind services supplied by the University of California, Davis include faculty salaries, office space, and technical support.

The Department of Water Resources will supply \$50,000 of in-kind services in the form of project management for Task 5.

## Applicant Qualifications

### UC Davis Investigator Qualifications

Jeffrey F. Mount received his Ph.D. in Earth Science from UC Santa Cruz in 1980. From 1980 to the present he has been a professor in the Department of Geology at UC Davis. During this time he has conducted research on stratigraphy and sedimentation, with an emphasis on process sedimentology of marine and non-marine depositional systems. His current research interests include: analysis of the hydrogeomorphic evolution of rivers in response to changing land use conditions; geochemical and petrologic identification of anthropogenic sediment sources within the Sacramento River watershed; and mechanics of geomorphic recovery in riverine systems affected by catastrophic sedimentation events.

During his 18 years at UC Davis he has supervised more than 15 graduate students and successfully managed nine large National Science Foundation grants and several American Chemical Society grants. He is currently the Principal Investigator or Co-Principal Investigator on three federally-funded, multidisciplinary grants that focus on watershed issues in the state of California. He serves as a member of several multiagency task forces focusing on floodplain management within the state, is the current Chair of the Department of Geology at UC Davis, and the Director of the UC Davis Center for Integrated Watershed Science and Management.

Peter B. Moyle has been working on the ecology and conservation of native California fishes for about 30 years, subjects on which he has published widely. He has a long-term involvement in instream flow studies and in studies on the ecology and conservation of freshwater and estuarine fishes. His long-term research program on Bay-Delta fishes led to the listing of the Delta smelt as an endangered species. His reward for this activity was to be appointed head to the Delta Native Fishes Recovery Team by the USFWS (completed in 1994) and, recently a member of the science Core Team for advising the massive CALFED effort to restore the estuary. Dr. Moyle also served

as member of the Sierra Nevada Ecosystem Project science team, working on strategies to keep the native aquatic fauna of the Sierra Nevada from sliding further towards extinction. One of his major roles, working with his postdocs and graduate students, is to compile and publish information needed to help make decisions as to whether or not endangered species listing of California native fish species is warranted. His current research focuses on (1) devising watershed-oriented strategies for conservation of the native aquatic fauna, (2) finding ways to reduce the impacts of invasive aquatic species, and (3) documenting the early life histories of stream fishes, probably the most critical and least understood part of their life cycle. He is a professor of fish biology in the Department of Wildlife, Fish, and Conservation Biology, University of California, Davis, where he has been since 1972.

James F. Quinn has degrees from Harvard (A.B. Biology, 1973) and the University of Washington (PhD, Zoology, 1979). He joined the faculty of the University of Pennsylvania in 1979, and moved to the University of California at Davis, where he is now a full professor, in 1981. He has worked on a variety of problems in community ecology and conservation biology, including the effects of habitat fragmentation on species diversity and extinction risk, strategies for inventory and monitoring studies, the design of systems of nature reserves, and estimation of demographic rates for fisheries management, and is the author of more than 60 scholarly publications.

Professor Quinn is a principal investigator for the California Rivers Assessment (CARA), a program to identify and assess the status of critical aquatic resources in California and to provide a database center and access point for environmental data from a variety of collaborating organizations. Professor Quinn also directs the Information Center for the Environment (ICE) at the University of California at Davis. Under his direction, the Center has developed the principal biodiversity databases for U.S. National Parks (NPFauna and NPFlora), UNESCO Biosphere Reserves worldwide (MABFauna and MABFlora) and a variety of public and private lands in California. The Center works closely with over 20 public agencies on monitoring information, databases, and Web services (<http://ice.ucdavis.edu>) involving biodiversity, water quality, and land use, both in California and internationally.

Professor Quinn serves on a number of advisory groups for California environmental policy, including the Science Coordinating Committee for the California Biodiversity Council and the board of the Point Reyes Bird Observatory. He also advises several of national and international data standards groups, including the National Biological Information Infrastructure, Office of Science and Technology Policy, the UNESCO Biosphere Reserve Inventory and Monitoring program, and the Inter Americas Biological Information Network.

Geoffrey Schladow is an Associate Professor of Water Resources and Environmental Engineering at UC Davis. He received his PhD from the University of Western Australia. Professor Schladow has extensive experience in modeling and measuring flow, sediment and water quality in hydrological systems. His recent research sites include the Sacramento River, Clear Lake, Whiskeytown Reservoir, the Lake Tahoe watershed and the Salton Sea. He is the lead scientist for the modeling and field measurement program directed at the restoration of the 50,000 acre Napa-Sonoma marsh. He is also the Principle Investigator on a multi-institutional proposal directed at intensively monitoring contaminant transport in tidal wetlands. Professor Schladow currently supervises a research group comprised of 1 post-doctoral scientist, 5 PhD and 5 Masters level students.

Gregory Pasternack is an Assistant Professor of Land, Air and Water Resources at UC Davis. He received his PhD from Johns Hopkins University in 1998. He has considerable experience as a fluvial geomorphologist and sediment transport specialist. He recently completed an extensive study of tidal freshwater marsh systems of the Chesapeake Bay. His specialties are in the physical dynamics of tidal freshwater delta evolution, the interactions between marsh plants and sedimentation patterns, watershed-scale transport and fate of sediment, and the impacts of management on urban river systems.

Edwin Grosholz



Cosumnes River Preserve  
13501 Franklin Boulevard  
Galt, California 95632

International Headquarters  
Arlington, Virginia

TEL 916 683-2142  
FAX 916 683-1702

April 14, 1999

Dr. Jeffrey Mount  
Director, Center for Integrated  
Watershed Science and Management  
University of California, Davis  
Davis, CA 95616

Dear Dr. Mount,

I am writing on behalf of The Nature Conservancy's Cosumnes River Project to express our support for the Watershed Center's McCormack-Williamson Tract Restoration Planning, Design and Monitoring Program.

The original proposal for acquisition of the McCormack-Williamson Tract included a funding request to support the research necessary to assist the Conservancy in establishing restoration parameters for the Tract and for evaluating long-term restoration strategies. That portion of the request was not funded during the last funding cycle; and thus significant questions about this property's long-term restoration potential still remain unresolved.

The University would bring to this issue a comprehensive, multi-disciplinary approach designed to yield results applicable to other Conservancy projects and to other freshwater marsh restoration efforts in the Bay-Delta. The work that you propose to do will support the Conservancy's stewardship responsibilities in the Cosumnes-Mokelumne Corridor and is consistent with the Conservancy's commitment to disseminate the lessons learned from the practice of adaptive management on its ecologically critical holdings.

We look forward to working with you and the other members of the UC Davis Watershed Science Consortium.

Sincerely,

A handwritten signature in cursive script that reads "Mike Eaton".

Michael Eaton  
Project Director



# San Joaquin Council of Governments

Member Agencies: Cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, Tracy, County of San Joaquin

April 7, 1999

Dr. Jeffrey Mount  
Center for Integrated Watershed Science and Management  
Kerr Hall 186  
University of California,  
Davis, CA 95616

Dear Dr. Mount:


The San Joaquin Council of Governments appreciates the opportunity to review your proposal for restoration planning, baseline studies and monitoring on the McCormack-Williamson Tract. San Joaquin COG is very supportive of the proposal and agrees that program will result in substantial benefits to anadromous fisheries production, aquatic habitats and riparian ecosystem integrity and diversity in our region.

The CALFED Bay-Delta Program's draft strategic plan for ecosystem restoration has identified several opportunities for river restoration in our region. Many of these opportunities are currently being pursued in the lower Mokelumne and Cosumnes rivers, including: the Army Corps of Engineers evaluation of ecosystem restoration and non-traditional flood damage; the San Joaquin Resource Conservation District's Lower Mokelumne Stewardship Program; The Nature Conservancy's management activities at the Cosumnes Preserve; and, East Bay Municipal Utilities District's Lower Mokelumne habitat restoration efforts. These programs, when fully implemented, will provide substantial progress toward restoring the Sacramento-San Joaquin Bay-Delta ecosystem, as well as providing great benefits to the residents of Sacramento and San Joaquin counties.

Your program is critical to the success of all of our efforts on the Mokelumne and Cosumnes rivers and forms an integral portion of the overall process to recover the ecosystem and support stable, self-sustaining populations of fish and wildlife species.

I offer the full support and cooperation of San Joaquin COG, and encourage other stakeholders in the lower Mokelumne River region to support your efforts.

Sincerely,

  
JULIA E. GREENE  
Executive Director

April 15, 1999

Dr. Jeffrey Mount  
Center for Integrated Watershed Science and Management  
Kerr Hall 186  
University of California,  
Davis, CA 95616

Dear Dr. Mount:

Thank you very much for the opportunity to review your proposal for restoration planning, baseline studies and monitoring on the McCormack-Williamson Tract. The District is supportive of the proposal and agrees that the program will result in benefits to anadromous fisheries, aquatic habitats and riparian ecosystem integrity and diversity.

Sincerely,



Dennis M. Diemer

CITY COUNCIL

KEITH LAND, Mayor  
STEPHEN J. MANN  
Mayor Pro Tempore  
SUSAN HITCHCOCK  
ALAN NAKANISHI  
PHILLIP A. PENNINO

# CITY OF LODI

CITY HALL, 221 WEST PINE STREET  
P.O. BOX 3006  
LODI, CALIFORNIA 95241-1910  
TEL. (209) 333-6700  
FAX (209) 333-6807

H. DIXON FLYNN  
City Manager

ALICE M. REIMCHE  
City Clerk

RANDALL A. HAYS  
City Attorney

April 8, 1999

Mr. Jeffrey Mount  
Center for Integrated Watershed Science and Management  
Kerr Hall 186  
University of California  
Davis, CA 95616

Dear Mr. Mount:

Thank you very much for the opportunity to review your proposal for restoration planning, baseline studies and monitoring on the McCormack-Williamson Tract. The City is very supportive of the proposal and agrees that the program will result in substantial benefits to anadromous fisheries production, aquatic habitats and riparian ecosystem integrity and diversity.

The CALFED Bay-Delta Program's draft strategic plan for ecosystem restoration has identified several opportunities for river restoration. Many of these opportunities are currently being pursued in the lower Mokelumne and Consumnes rivers, including the Army Corps of Engineers evaluation of ecosystem restoration and non-traditional flood damage; the San Joaquin Resource Conservation District's Lower Mokelumne Stewardship Program; and, The Nature Conservancy's management activities at the Consumnes Preserve.

Cooperative actions such as your joint proposal to achieve and maintain these objectives are encouraged. These programs, when fully implemented, will provide substantial progress in restoring the Sacramento-San Joaquin Bay-Delta ecosystems, as well as providing great benefits to the residents of the City of Lodi and San Joaquin and Sacramento counties.

Your program is critical to the success of the ongoing efforts in the Mokelumne and Consumnes rivers and forms an integral portion of the overall process to recover the ecosystem and support stable, self-sustaining populations of fish and wildlife species.

I offer the City's full support and cooperation, and encourage other stakeholders in the lower Mokelumne River area to support your efforts.

Very truly yours,

  
H. Dixon Flynn  
City Manager



## San Joaquin County Resource Conservation District

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April 12, 1999

Dr. Jeffrey Mount  
Center for Integrated Watershed Science and Management  
Kerr Hall 186  
University of California,  
Davis, CA 95616

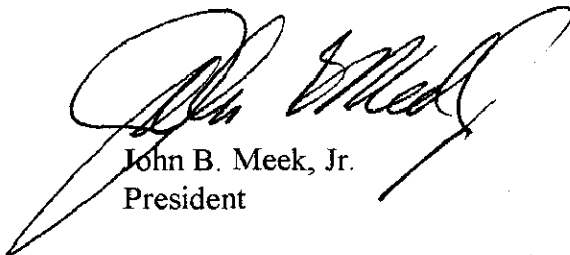
Dear Dr. Mount:

The San Joaquin County Resource Conservation District has reviewed your proposal to conduct restoration planning, baseline studies, and monitoring on the McCormack-Williamson Tract and has found the proposed project consistent with our ongoing watershed stewardship program on the lower Mokelumne River. We are very supportive of the proposal and believe that the program will result in substantial benefits to riparian ecosystem integrity and diversity, as well as benefits to anadromous fisheries production and aquatic habitats on the lower Mokelumne River.

Your program is a valuable addition to ongoing efforts to restore ecosystem functions in the Mokelumne and Cosumnes River. Your program will further CALFED's stated objectives, as expressed in the Bay-Delta Program's draft strategic plan. It is also consistent with East Bay Municipal Utility District's Lower Mokelumne River Joint Settlement Agreement (FERC Project No. 2916-004), and The Nature Conservancy's management activities at the nearby Cosumnes Preserve.

I am pleased to offer the San Joaquin County Resource Conservation District's full support and cooperation of your proposed project, and encourage other stakeholders in lower Mokelumne River area to support your efforts as well.

Sincerely,



John B. Meek, Jr.  
President



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

April 15, 1999

Environmental Resources Branch

Dr. Jeffery Mount  
Center for Integrated Watershed  
Science and Management  
Kerr Hall 186  
University of California,  
Davis, CA 95616

Dear Dr. Mount:

Thank you very much for the opportunity to review your proposal for restoration planning, baseline studies and monitoring on the McCormack-Williamson Tract. The Corps is very supportive of the proposal and agrees that the program will result in substantial benefits to anadromous fisheries production, aquatic habitats and riparian ecosystem integrity and diversity.

The CALFED Bay-Delta Program's draft strategic plan for ecosystem restoration has identified several opportunities for river restoration. Many of these opportunities are currently being pursued in the lower Mokelumne and Cosumnes rivers, including the Corp's cooperative effort between the Nature Conservancy, and East Bay Municipal Utilities District that will evaluate ecosystem restoration and non-traditional flood damage; the San Joaquin Resource Conservation District's Lower Mokelumne Stewardship Program; and, The Nature Conservancy's management activities at the Cosumnes Preserve. In addition, East Bay Municipal Utilities District is pursuing protection and enhancement for the anadromous fishery and ecosystem of the lower Mokelumne River through the Lower Mokelumne River Joint Settlement Agreement (FERC Project No. 2916-004). These programs, when fully implemented will provide substantial progress in restoring the Sacramento-San Joaquin Bay-Delta ecosystem, as well as providing great benefits to the residents of Sacramento and San Joaquin counties.

Your program is critical to the success of the ongoing efforts in the Mokelumne and Cosumnes rivers and forms an integral portion of the overall process to recover the ecosystem and support stable, self-sustaining populations of fish and wildlife species.

I offer the Corps' full support and cooperation, and encourage other stakeholders in the region to support your efforts.

Sincerely,

Walter Yep  
Chief, Planning Division

DIRECTORS  
**WILLIAM STOKES**  
PRESIDENT  
**ED LUCCHESI**  
VICE PRESIDENT  
**ADAM VAN EXEL**  
**JOE COTTA, JR.**  
**BILL SHINN**

**WOODBIDGE IRRIGATION DISTRICT**  
**18777 N. LOWER SACRAMENTO ROAD**  
**WOODBIDGE, CALIFORNIA 95258**  
**(209) 369-8808**  
**FAX: 369-8823**

**ANDERS CHRISTENSEN**  
MANAGER  
SECRETARY/TREASURER  
**JIM SHULTS**  
SUPERINTENDENT

April 9, 1999

Dr. Jeffrey Mount  
Center for Integrated Watershed Science and Management  
Kerr Hall 186  
University of California,  
Davis, CA 95616

Dear Dr. Mount:

I would like to take this opportunity to support your proposal for restoration planning, baseline studies and monitoring on the McCormack-Williamson Tract. We are very supportive of the proposal and feel that this program will help to meet CALFED ERP targets and goals for the Bay Delta ecosystem

We have also supported a number of other programs and initiatives on the Mokelumne and Consumnes river including our own Lower Mokelumne River Restoration Program(LMRRP) All of these programs, when implemented provide opportunities for restoring the Bay-Delta ecosystem and improvements to the fishery including anadromous species.

These programs are vital programs for the environment and should be fully implemented. We encourage CALFED to fully fund your project. If we can support your project further, please let me know.

Very truly yours,



Anders Christensen  
General Manager



JOHN MUIR INSTITUTE OF THE ENVIRONMENT

ONE SHIELDS AVENUE  
DAVIS, CALIFORNIA 95616

April 15, 1999

San Joaquin County Board of Supervisors  
Attn: Board Clerk  
222 E. Weber Ave.  
Stockton, CA 95202

Dear Members of the Board,

I am writing to inform you that the Center for Integrated Watershed Science and Management of the University of California, Davis, in cooperation with The Nature Conservancy, is applying for Calfed Category III funds to initiate a long-term restoration planning and evaluation effort on the McCormack-Williamson Tract.

As you know, a 1997 Calfed grant funded the acquisition of the Tract by The Nature Conservancy, but no provision was made at that time for planning or implementation of restoration activities. The application that we are submitting this month seeks funding to support the research necessary to assist the Conservancy in establishing restoration parameters and evaluating long-term restoration strategies.

The general objective of this study is to determine the geomorphic potential of the site to revert back to a functional and sustainable tidal freshwater marsh, with an array of habitats beneficial to critical species, such as splittail and Chinook salmon. The study will analyze the historical environmental conditions on the Tract and relate these to the hydrology of the lower Mokelumne and Cosumnes rivers, ultimately modeling the conditions that may develop within a restored tidal freshwater marsh at McCormack-Williamson. The second part of the study involves a comprehensive survey of baseline data on biologic conditions to serve as the basis for monitoring and assessment of long-term restoration effectiveness.

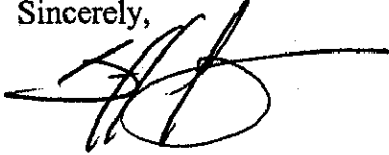
The project will involve researchers in the fields of geology, hydrology, engineering and wildlife biology; and this comprehensive, multidisciplinary approach is designed to produce results that will inform future freshwater marsh restoration projects throughout the Bay-Delta. The studies will be conducted in such a way as to not disrupt or disturb on-going agricultural operations on the Tract.

The Center considers collaboration and communication essential to its mission of improving watershed science and management. We have an on-going collaborative arrangement with The Nature Conservancy and its partners at the Cosumnes Preserve (Bureau of Land Management, Department of Fish and Game, Department of Water Resources, Ducks Unlimited, Sacramento County Parks and Recreation); and through the Conservancy and the East Bay Municipal Utility District have been in contact with a number of local agencies, landowners and representatives of stakeholder groups in the lower Cosumnes/Mokelumne basins. If Calfed should approve this application, the Center will work

closely with the Nature Conservancy and other regional coordinating bodies to assure early stakeholder involvement in the planning and decision-making process at McCormack-Williamson.

Thank-you for your consideration. A more detailed description of the proposed project is attached. If you have any questions, please contact me or Ellen Mantalica, Watershed Center Coordinator, at (530) 754-9133.

Sincerely,

A handwritten signature in black ink, appearing to be 'J. Mount', with a long horizontal stroke extending to the right.

Dr. Jeffrey Mount  
Director, Center for Integrated Watershed  
Science and Management



JOHN MUIR INSTITUTE OF THE ENVIRONMENT

ONE SHIELDS AVENUE  
DAVIS, CALIFORNIA 95616

April 15, 1999

Planning Department  
San Joaquin County  
222 E. Weber Ave.  
Stockton, CA 95202

Dear Planning Staff,

I am writing to inform you that the Center for Integrated Watershed Science and Management of the University of California, Davis, in cooperation with The Nature Conservancy, is applying for Calfed Category III funds to initiate a long-term restoration planning and evaluation effort on the McCormack-Williamson Tract.

As you know, a 1997 Calfed grant funded the acquisition of the Tract by The Nature Conservancy, but no provision was made at that time for planning or implementation of restoration activities. The application that we are submitting this month seeks funding to support the research necessary to assist the Conservancy in establishing restoration parameters and evaluating long-term restoration strategies.

The general objective of this study is to determine the geomorphic potential of the site to revert back to a functional and sustainable tidal freshwater marsh, with an array of habitats beneficial to critical species, such as splittail and Chinook salmon. The study will analyze the historical environmental conditions on the Tract and relate these to the hydrology of the lower Mokelumne and Cosumnes rivers, ultimately modeling the conditions that may develop within a restored tidal freshwater marsh at McCormack-Williamson. The second part of the study involves a comprehensive survey of baseline data on biologic conditions to serve as the basis for monitoring and assessment of long-term restoration effectiveness.

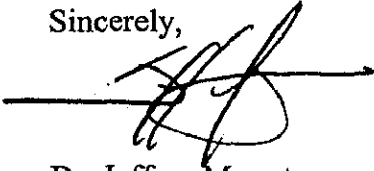
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Thank-you for your consideration. A more detailed description of the proposed project is attached. If you have any questions, please contact me or Ellen Mantalica, Watershed Center Coordinator, at (530) 754-9133.

Sincerely,

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Dr. Jeffrey Mount  
Director, Center for Integrated Watershed  
Science and Management

# UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

JOHN MUIR INSTITUTE OF THE ENVIRONMENT

ONE SHIELDS AVENUE  
DAVIS, CALIFORNIA 95616

April 15, 1999

Sacramento County Board of Supervisors  
700 H Street Suite 2450  
Sacramento, CA 95814

Dear Supervisors,

I am writing to inform you that the Center for Integrated Watershed Science and Management of the University of California, Davis, in cooperation with The Nature Conservancy, is applying for Calfed Category III funds to initiate a long-term restoration planning and evaluation effort on the McCormack-Williamson Tract.

As you know, a 1997 Calfed grant funded the acquisition of the Tract by The Nature Conservancy, but no provision was made at that time for planning or implementation of restoration activities. The application that we are submitting this month seeks funding to support the research necessary to assist the Conservancy in establishing restoration parameters and evaluating long-term restoration strategies.

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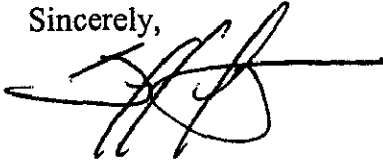
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JOHN MUIR INSTITUTE OF THE ENVIRONMENT

ONE SHIELDS AVENUE  
DAVIS, CALIFORNIA 95616

April 15, 1999

Planning Department  
Sacramento County  
700 H Street Suite 2450  
Sacramento, CA 95814

Dear Planning Staff,

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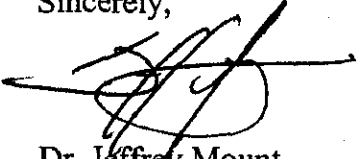
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JOHN MUIR INSTITUTE OF THE ENVIRONMENT

ONE SHIELDS AVENUE  
DAVIS, CALIFORNIA 95616

April 15, 1999

Delta Protection Commission  
14215 River Road  
P.O. Box 530  
Walnut Grove, CA 95690

Dear Commissioners,

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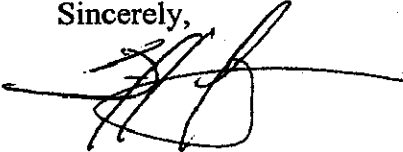
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